I. Listing of Claims

1. (Original): A medical device (110) comprising a unitarily and continuously formed portion (108) having a varying durometer.

2. (Original): The medical device (110) according to claim 1, further comprising an inflatable balloon (18 or 118) connected to the unitarily and continuously formed portion (108).

3. (Original): The medical device (110) according to claim 2, wherein the inflatable balloon (18) is not unitarily and continuously formed with the unitarily and continuously formed portion (108).

4. (Original): The medical device (110) according to claim 1, wherein the unitarily and continuously formed portion (108) comprises a tubular portion (106).

5. (Original): The medical device (110) according to claim 4, wherein the unitarily and continuously formed portion (108) further comprises an inflatable balloon (118) unitarily and continuously formed with the tubular portion (106), the inflatable balloon (118) and the tubular portion (106) having different durometers.

6. (Original): The medical device (110) according to claim 4, wherein the unitarily and continuously formed portion (108) further comprises an anchor structure (170) unitarily and continuously formed with the tubular portion (106), the anchor structure (170) and the tubular portion (106) having different durometers.

7. (Original): The medical device (110) according to claim 6, wherein the anchor structure (170) comprises a malecot (172), a pigtail (174) or a loop (176).

8. (Original): The medical device (110) according to claim 4, wherein the tubular portion (106) comprises a catheter shaft (111).

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9. (Original): The medical device (110) according to claim 8, wherein the catheter shaft (111) comprises at least first and second catheter shaft segments (178 and 180) of different durometer, the first and second catheter shaft segments (178 and 180) being unitarily and continuously formed.

10. (Original): The medical device (110) according to claim 9, wherein one of the at least first and second catheter shaft segments (178 or 180) comprises a catheter tip (184) and the other of the at least first and second catheter shaft segments (178 or 180) comprises a catheter body (186).

11. (Original): The medical device (110) according to claim 10, wherein the catheter tip (184) has a greater durometer than the catheter body (186).

12. (Original): The medical device (110) according to claim 11, wherein the catheter tip (184) includes a distal end (190) and a step or ledge (188) formed in the catheter tip (184) near the distal end (190), and wherein the medical device (110) further comprises a needle (192) receivable in the catheter shaft (111), the needle (192) bearing on it a ring, collar or enlargement (194) engageable with or abuttable against the step or ledge (188) in the catheter tip (184).

13. (Original): The medical device (110) according to claim 10, wherein the catheter body (186) has a greater durometer than the catheter tip (184).

14. (Original): The medical device (110) according to claim 1, wherein the unitarily and continuously formed portion (108) comprises at least first and second unitarily and continuously formed parts (102 and 104) having different durometers, and a transition zone (105) of continuously varying durometer connecting the first and second parts (102 and 104), the transition zone (105) being unitarily and continuously formed with the first and second parts.

15. (Original): The medical device (110) according to claim 1, wherein the unitarily and continuously formed portion (108) extends longitudinally, and

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wherein the durometer of the unitarily and continuously formed portion (108) varies continuously along the length of the portion (108).

16. (Original): The medical device (110) according to claim 1, comprising a catheter shaft (211) having an outer catheter shaft (114) and an inner catheter shaft (112) received in the outer catheter shaft (114), the outer catheter shaft (114) comprising the unitarily and continuously formed portion (108).

17. (Original): The medical device (110) according to claim 16, further comprising an inflatable balloon (18) connected to the outer catheter shaft (114) and the inner catheter shaft (112) although not unitarily and continuously formed with either the outer catheter shaft (114) or the inner catheter shaft (112).

18. (Original): The medical device (110) according to claim 16, wherein the outer catheter shaft (114) further comprises an inflatable balloon (118) unitarily and continuously formed with the unitarily and continuously formed portion (108), the inflatable balloon (118) and the unitarily and continuously formed portion (108) having different durometers.

19. (Original): The medical device (110) according to claim 1, wherein the unitarily and continuously formed portion (108) comprises an irradiation cross-linkable mixture of a polyamide elastomer and at least one additional cross-linking reactant.

20. (Original): The medical device (110) according to claim 19, wherein the cross-linking reactant comprises:

(a) a difunctional material selected from the class consisting of diallyl adipate; diallyl carbonate; diallyl maleate; diallyl succinate; diallyl tetrabromophthalate; diethyl diallylmalonate; dimethyl diallylmalonate; and 2,2,6,6 tetra-bromobisphenol A diallyl ether;

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(b) a trifunctional material selected from the class consisting of 2, 5-diallyl-4, 5-dimethyl-2-cyclopenten-1-one; diallyl fumarate; diallyl itaconate; 1, 3, 5-triallyi-2 methoxybenzene; triallyl trimesate (triallyl 1, 3, 5-benzenetricarboxylate); triallyl trimellitate (triallyl 1, 2, 4-benzenetricarboxylate); and pentaerythritol triallyl ether;

(c) a tetrafunctional material selected from the class consisting of tetraallyl cis,cis,cis,cis-cyclopentane-1,2,3,4-tetracarboxylate; and N,N,N',N'-tetraallylethylenediamine; or

(d) an aromatic molecule containing at least two ring substituents, each of the ring substituents having labile hydrogens at a benzylic site therein; and

wherein the unitarily and continuously formed portion (108) comprises at least first and second parts (102 and 104) unitarily and continuously formed with one another, at least one of the first and second parts (102 or 104) being exposed to cross-linking irradiation.

21. (Original): The medical device (110) according to claim 19, wherein the unitarily and continuously formed portion (108) comprises at least first and second parts (102 and 104) unitarily and continuously formed with one another, and wherein the first and second unitarily and continuously formed parts (102 and 104) of the unitarily and continuously formed portion (108) are exposed to different amounts of cross-linking irradiation.

22. (Original): The medical device (110) according to claim 20, wherein the mixture comprises about 1 to about 3 percent by weight of the difunctional material; about 0.5 to about 1.5 percent by weight of the trifunctional material or the aromatic molecule containing at least two ring substituents, each of the ring substituents having labile hydrogens at a benzylic site therein; or about 0.01 to about 1 percent by weight of the tetrafunctional material.

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23. (Original): The medical device (110) according to claim 19, wherein the unitarily and continuously formed portion (108) comprises an amount of the at least one cross-linking reactant sufficient to give the unitarily and continuously formed portion (108) a strength generally about equal to that of a unitarily and continuously formed portion (108) composed of the polyamide elastomer and comparably cross-linked by irradiation, but in the absence of any cross-linking reactant, agent or promoter.

24. (Original): The medical device (110) according to claim 19, wherein the unitarily and continuously formed portion (108) comprises a mixture of the polyamide elastomer and the at least one cross-linking reactant which has been cross-linked, at least in part, by irradiation with an electron beam or with ultraviolet, X- or gamma rays.

25. (Original): The medical device (110) according to claim 19, wherein the unitarily and continuously formed portion (108) comprises a mixture of the polyamide elastomer and the at least one cross-linking reactant which has been cross-linked, at least in part, by exposure to about 0.5 to about 60 megarads of radiation.

26. (Original): The medical device (110) according to claim 19, further comprising an inflatable balloon (18) connected to the unitarily and continuously formed portion (108) although not unitarily and continuously formed with the portion (108).

27. (Original): The medical device (110) according to claim 19, wherein the unitarily and continuously formed portion (108) comprises a tubular portion (106) and an inflatable balloon (118) unitarily and continuously formed with the tubular portion (106), wherein the inflatable balloon (118) is formed by inflation of the mixture of the polyamide elastomer and the at least one cross-linking reactant after at least part of the mixture has been cross-linked by irradiation.

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28. (Original): The medical device (110) according to claim 20, wherein the mixture comprises an irradiation cross-linkable mixture of a polyamide elastomer and an aromatic molecule containing at least two ring substituents, each of the ring substituents having labile hydrogens at a benzylic site therein, selected from the class consisting of 1,3,5 triethyl benzene; 1,2,4 triethyl benzene; and 1,3,5 triisopropyl benzene.

29. (Original): The medical device (110) according to claim 19, wherein the mixture comprises at least one polyamide elastomer selected from the class consisting of polyester amides, polyether ester amides and polyether amides.

30. (Original): The medical device (110) according to claim 29, wherein the mixture comprises a nylon block copolymer.

31. (Original): The medical device (110) according to claim 30, wherein the mixture comprises a nylon block copolymer including polyether blocks separated by polyamide blocks.

32. (Original): The medical device (110) according to claim 19, wherein the unitarily and continuously formed portion (108) comprises an irradiation cross-linkable mixture of a polyamide elastomer and about 0.5 percent to about 5 percent by weight of at least one additional cross-linking reactant, the cross-linking reactant comprising triallyl cyanurate or triallyl isocyanurate.

33. (Original): The medical device (110) according to claim 19, wherein the at least one cross-linking reactant comprises diallyl phthalate or meta-phenylene dimaleimide.

34. (Original): The medical device (110) according to claim 33, wherein the mixture comprises about 1 to about 2 percent by weight of the at least one cross-linking reactant.

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35. (Original): The medical device (110) according to claim 19, wherein the mixture comprises: a nylon block copolymer including polyether blocks separated by polyamide blocks, about 3 percent by weight triallyl isocyanurate and about 10 percent by weight nylon.

36. (Original): A medical device (110) comprising a unitarily and continuously formed portion (108) having a varying durometer; a catheter shaft (211) having an outer catheter shaft (114) and an inner catheter shaft (112) received in the outer catheter shaft (114), the outer catheter shaft (114) comprising the unitarily and continuously formed portion (108); and an inflatable balloon (18) connected to the outer catheter shaft (114) and the inner catheter shaft (112), although not unitarily and continuously formed with the unitarily and continuously formed portion (108); wherein the inflatable balloon (18) and the unitarily and continuously formed portion (108) have different durometers; and wherein the unitarily and continuously formed portion (108) comprises an irradiation cross-linkable mixture of a nylon block copolymer including polyether blocks separated by polyamide blocks, about 3 percent by weight triallyl isocyanurate and about 10 percent by weight nylon.

37. (Original): A medical device (110) comprising a unitarily and continuously formed portion (108) having a varying durometer, and a catheter shaft (211) having an outer catheter shaft (114) and an inner catheter shaft (112) received in the outer catheter shaft (114), the outer catheter shaft (114) comprising the unitarily and continuously formed portion (108); wherein the outer catheter shaft (114) further comprises an inflatable balloon (118) unitarily and continuously formed with the unitarily and continuously formed portion (108), the inflatable balloon (118) and the unitarily and continuously formed portion (108) having different durometers; and wherein the unitarily and continuously formed portion (108) comprises an irradiation cross-linkable mixture of a nylon block copolymer including polyether blocks separated by polyamide blocks, about 3 percent by weight triallyl isocyanurate and about 10 percent by weight nylon.

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38. (Original): A medical device (110) comprising a unitarily and continuously formed portion (108) having a varying durometer, the unitarily and continuously formed portion (108) comprising a catheter shaft (111) having at least first and second catheter shaft segments (178 and 180) of different durometer, the first and second catheter shaft segments (178 and 180) being unitarily and continuously formed; wherein one of the at least first and second catheter shaft segments (178 or 180) comprises a catheter tip (184) and the other of the at least first and second catheter shaft segments (178 or 180) comprises a catheter body (186), the catheter tip (184) having a greater durometer than the catheter body (186); and wherein tile unitarily and continuously formed portion (108) comprises an irradiation cross-linkable mixture of a nylon block copolymer including polyether blocks separated by polyamide blocks, about 3 percent by weight triallyl isocyanurate and about 10 percent by weight nylon.

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